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much to enliven and augment them will be found in a book which modestly attempts to lay the foundations of a phylogeny of physiological processes. In the concluding chapter occur, among others, generalized summaries of the three principal methods of food intake; an interesting section on salivation with its numerous differentiations; and a phylogeny of the ferments in which trypsin or trypsin-like substances are held to be the oldest. Other matters considered in the final chapter are genetic comparisons of the histological processes involved in secretion and absorption, the fate of absorptia, and finally a discussion of "the liver question," especially interesting to those who question the validity of christening invertebrate organs according as their color, form or location happens to resemble something or other in a vertebrate. This section is summed up in the following paragraph:

"The specialization of a stomach with the secretion of free acid and the necessary pepsin, the formation of special glands, segregated from the digestive epithelium, though pouring their juices into the alimentary tract, the occurrence of a liver correlated with digestion, and finally complicated regulations in the functions of these organs; all this distinguishes the digestive processes of vertebrates from those of invertebrates."

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May 13, 1913

Die sanitär-pathologische Bedeutung der Insekten und verwandten Gliedertiere, namentlich als Krankheits-Erreger und Krankheits-Uberträger. By EMIL A. GÖLDI. Berlin, R. Friedländer & Sohn. 1913. Pp. 155, Figs. 171.

The present small volume which contains a general account of the habits of insects in their relation to diseases is based on material presented by Professor Göldi in a course of lectures which he has been giving for a number of years in the University of Bern.

In spite of its limited size it gives a very

good presentation of such facts as can be satisfactorily included in a university course on insects and diseases, and is much better suited for the general student than those portions of the text-books on tropical medicine that are devoted to insects. Its value lies mainly in the fact that the subject is considered primarily from the biological rather than the medical standpoint, and consequently in a more connected and intelligible way for this class of students.

The subject matter is perhaps somewhat different than would be indicated by the title, as much emphasis is laid upon insects which live partly or entirely as parasites of man and domestic animals, to which is added a supplementary discussion of their relation to the transmission of disease. The material is divided into three chapters: first, stinging, biting and caustic insects; second, insects and related Arthropods of parasitic habits; and third, insects and other Arthropods as carriers of disease. The first section is quite fully treated, but the bulk of the text is devoted to the second section, and the third receives rather brief consideration. One might wish that the portion relating to insects as carriers of various infections had been presented in more complete form, but this omission is more apparent than real, for the second chapter contains much material (*e. g.*, the development of trypanosomes) which one might expect to find in the third.

Göldi describes the morphology and physiology of the poison apparatus in the Hymenoptera, scorpions, centipedes and Hemiptera and points out the probable functions of the poison glands in different groups. Thus in the Hemiptera, spiders and centipedes, the so-called poison has apparently been developed as a digestive fluid. He is inclined to believe also that the venom of the scorpion has a digestive function in addition to its poisonous properties. Following this is a discussion of insects, mainly caterpillars of various kinds, that are provided with poisonous bristles or spines which cause irritation to the skin. Numerous species are figured, including a considerable number from equatorial America.

The section devoted to parasitic insects and other Arthropods opens with an account of mosquitoes which covers some twenty pages and contains in addition to general matter much valuable information on the carriers of malaria and yellow fever, and on other mosquitoes of the Amazonian region, based on original observations made by the author. Following this is a similar but shorter discussion of the gad-flies (Tabanidæ), the blood-sucking Muscidæ, Simuliidæ, Chironomidæ and Psychodidæ. The phlebotomic members of these families are spoken of by Göldi as habitual (professionelle) blood-suckers and hemiparasites (Halbparasiten) in distinction of other wholly parasitic forms (Ganzparasiten) which remain on the host during their entire life, or at least during their preparatory stages. Following this is an account of the more highly modified Diptera Pupipara and the fleas, the latter being treated at some length. The sucking lice are briefly mentioned as well as bedbugs and a few other blood-sucking Hemiptera. Ticks and mites follow, the mites receiving by far more space in proportion to their importance as disease carriers. Under the heading of myiasis are described many of the Diptera which develop regularly or occasionally as internal parasites of man and other mammals.

The third chapter on "Insects and Related Arthropods as Carriers of Disease" deals with the distribution and manner of transfer of insect-borne diseases, as well as with the morphology and life-cycles of a number of the causal microorganisms, such as the malarial parasites, trypanosomes, filarias, etc.

The volume is profusely illustrated by 171 text-figures, mainly in half-tone, derived from various sources with a smaller number of original figures. All are well selected, but many are inferior to those in the original works from which they have been copied. Some of the names applied to the insects mentioned are rather antiquated; thus one sees *Lucilia macellaria* and *Musca vomitoria* appearing in the text in place of generic names which have been used for many years. In the description of Fig. 103, representing some North Ameri-

can ticks, there is an unfortunate confusion of names, where *Dermacentor venustus*, the vector of Rocky Mountain spotted tick fever, is referred to as the "gefleckte Texasfieberzecke des Felsengebirges" (Rocky Mountain spotted Texas-fever tick). This species has, of course, no connection with Texas fever of cattle.

The text is well printed, furnished with a good index, and shows only a small number of typographical errors. So far as the reviewer can judge, there are no serious errors of statement, although some parts, such as those on the food and anatomical characters of the larvæ of *Stomoxys calcitrans*, are open to some criticism.

The book is one which may well be placed in the hands of students as a text, and it is to be hoped that its author may later see fit to enlarge it into a more extended treatise.

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SCIENTIFIC JOURNALS AND ARTICLES

IN January, 1913, *The American Mathematical Monthly* passed into the control of an editorial board consisting of representatives of twelve supporting universities and colleges in the middle west, together with B. F. Finkel, founder of the *Monthly* and editor since its inception in 1894.

It is the editorial policy of this journal to appeal especially to teachers of mathematics in the collegiate and advanced secondary fields, not only for the purpose of directing attention to questions of improvement in teaching in these fields, but also to foster the development of the scientific spirit among large numbers who are not now reached by the more technical journals.

A selection from the Tables of Contents of the first six numbers includes articles on—

The History of Mathematics, such as the following:

"History of the Exponential and Logarithmic Concepts," by Professor Florian Cajori, of Colorado College.

"The Foundation Period in the History of